

Amendments to the Claims

1. (currently amended) A system for recharging and communicating with ~~a body implanted~~
an implantable stimulator having a rechargeable battery comprising:
 - a base station;
 - an antenna/charging coil coupled to the base station that is used to inductively charge
the rechargeable battery within the ~~implanted~~ implantable stimulator and to
transcutaneously communicate with the stimulator[[],];
 - ~~wherein the antenna/charging coil is coupled to the base station;~~
 - ~~means~~ first circuitry for driving the antenna/charging coil with a charging signal when
used as a charging coil; ~~and~~
 - ~~means~~ second circuitry for driving the antenna/charging coil with a communication
signal when used as a communication coil;
 - a booster coil coupled to the base station that is used to recover the rechargeable
battery when is it depleted to zero volts, wherein the booster coil is different from
the antenna/charging coil; and
 - third circuitry for driving the booster coil, wherein the third circuitry is different from
the first circuitry.
2. (currently amended) The system of claim 1, ~~further comprising:~~
 - ~~circuitry for~~ wherein the second circuitry accomplishing accomplishes forward and
backward frequency shift keying (FSK) telemetry with the ~~implanted~~ implantable
stimulator,
 - wherein the antenna/charging coil is configured and dimensioned to enable FSK
telemetry.

3. (currently amended) The system of claim 2, ~~further comprising:~~
~~circuitry for wherein the second circuitry accomplishing~~ accomplishes forward on-off keying (OOK) telemetry with the ~~implanted~~ implantable stimulator using the antenna/charging coil.
4. (currently amended) The system of claim 1, further comprising:
~~a~~ current measuring circuitry for determining power consumption in the antenna/charging coil.
5. (currently amended) The system of claim 1, further comprising:
a printed circuit board (PCB) coupled to the antenna/charging coil and to the booster coil; and
~~a~~ sensing circuitry for sensing temperature included on the PCB.
6. (currently amended) The system of claim 5, further comprising:
~~an~~ automatic power shut-off circuitry for automatically shutting off power to the antenna/charging coil when the sensed temperature through the antenna/charging coil exceeds a predetermined level.
7. (canceled)
8. (currently amended) The system of claim ~~[[7]]~~ 1, wherein the booster coil has ~~about 6 a plurality of~~ turns of ~~multi-stranded Litz wire in 2 a plurality of layers of 3 turns each,~~ wrapped around a coil spool.

9. (currently amended) The system of claim ~~[[7]]~~ 1, further comprising:
a power sensing circuitry for determining power consumption in the booster coil; and
~~an~~ automatic power shut-off circuitry for automatically shutting off power to the
booster coil when the power consumption through the booster coil exceeds a
predetermined power level.
10. (currently amended) The system of claim ~~[[7]]~~ 1, further comprising:
a chair pad coupled to the base station;
a printed circuit board (PCB) contained in the chair pad;
~~a~~ sensing circuitry for sensing temperature included on the PCB; and
~~an~~ automatic power shut-off circuitry for automatically shutting off power to the
booster coil when the sensed temperature ~~through the booster coil~~ exceeds a
predetermined power level.
11. (currently amended) The system of claim 1, wherein the antenna/charging coil has ~~about~~
~~24~~ a plurality of turns of ~~multi-stranded Litz-wire~~ wrapped around a ~~200 mm inside diameter~~ coil
spool.
12. (currently amended) The system of claim 10 wherein the chair pad is further comprised
of:
a compliant ~~chair pad~~ housing made of ~~polyurethane~~ foam; and
~~a chair pad printed circuit board (PCB); and~~
a coil assembly housing which contains ~~a~~ the booster coil, the antenna/charging coil
and the ~~chair pad~~ PCB,
wherein the ~~polyurethane~~ foam housing encapsulates the coil assembly housing.

13. (currently amended) The system of claim 12, wherein the chair pad is further comprised of:

~~padding that surrounds the polyurethane foam housing; and~~
an exterior slipcover that surrounds the ~~padding~~ housing.

14. (currently amended) The system of claim 1, ~~further comprising:~~

~~a wherein the~~ booster coil ~~that~~ is placed in a coil assembly with the antenna/charger coil, wherein the booster coil and antenna coil are wound over a spool coil in a configuration to present at least one substantially flat side; ~~and~~
~~a coil shield which is grounded and which shield is placed as part of the coil assembly to substantially cover the antenna/charger coil and the booster coil,~~
wherein the coil assembly is fully encapsulated in an external housing.

15. (currently amended) The system of claim 14, wherein the housing is ~~polyurethane foam and has approximate dimensions that are about or smaller than 50 cm by 50 cm by 15 cm thick.~~

16. (previously presented) The system of claim 10, further comprising:

a chair pad cable that connects the chair pad to the base station; and
detection circuitry for automatically detecting disconnection of the chair pad cable from the chair pad.

17. (currently amended) The system of claim ~~[[9]]~~ 1, wherein the base station includes:

a speaker for generating an audible sound to signal a ~~significant~~ system event.

18. (currently amended) The system of claim 1, ~~further comprising:~~
a ~~booster coil for use in zero volt battery recovery (ZVR); and~~
~~first and second impedance matching networks,~~
wherein ~~a first amplifier power supply~~ the first circuitry is impedance matched to the
antenna/charging coil ~~is impedance matched with the~~ a first impedance matching
network; and
wherein the third circuitry is impedance matched ~~a second amplifier power supply~~ to
the booster coil ~~is impedance matched with the~~ a second impedance matching
network.
19. (original) The system of claim 18, wherein the first impedance matching network is a 50
Ohm matching network and the second impedance matching network is a 50 Ohm matching
network.
20. (currently amended) The system of claim 1, wherein the system includes the implantable
stimulator, and wherein the implantable stimulator is a microstimulator having a maximum
length-wise dimension of about 3.5 centimeters and a maximum width of about 5 millimeters.
21. (currently amended) The system of claim 1, further comprising:
a sensor for detecting power levels in the antenna/charging coil; and
a variable output power supply that automatically adjusts downwards when ~~the power~~
~~levels detected by the sensor~~ detects power levels that exceed a predetermined
level[[s]],
wherein the variable output power supply is contained within the base station.
- 22-43. (canceled)

44. (currently amended) The system of claim 4, further comprising:
an automatic power shut-off circuitry for automatically shutting off power to the antenna/charging coil when the power consumption through the antenna/charging coil exceeds a predetermined level.
45. (new) A system for recharging and communicating with an implantable stimulator having a rechargeable battery comprising:
a base station;
an antenna/charging coil coupled to the base station that is used to inductively charge the rechargeable battery within the implantable stimulator and to transcutaneously communicate with the stimulator;
first circuitry for driving the antenna/charging coil with a charging signal when used as a charging coil;
second circuitry for driving the antenna/charging coil with a communication signal when used as a communication coil;
a sensor external to the implantable stimulator for detecting power levels in the antenna/charging coil; and
a variable output power supply contained within the base station that automatically adjusts downwards when the sensor detects power levels that exceed a predetermined level.
46. (new) The system of claim 45,
wherein the second circuitry accomplishes forward and backward frequency shift keying (FSK) telemetry with the implantable stimulator,
wherein the antenna/charging coil is configured and dimensioned to enable FSK telemetry.

47. (new) The system of claim 46,
wherein the second circuitry accomplishes forward on-off keying (OOK) telemetry
with the implantable stimulator using the antenna/charging coil.
48. (new) The system of claim 45, further comprising:
current measuring circuitry for determining power consumption in the
antenna/charging coil.
49. (new) The system of claim 48, further comprising:
automatic power shut-off circuitry for automatically shutting off power to the
antenna/charging coil when the power consumption through the antenna/charging
coil exceeds a predetermined level.
50. (new) The system of claim 45, further comprising:
a printed circuit board (PCB) coupled to the antenna/charging coil; and
sensing circuitry for sensing temperature included on the PCB.
51. (new) The system of claim 50, further comprising:
automatic power shut-off circuitry for automatically shutting off power to the
antenna/charging coil when the sensed temperature through the antenna/charging
coil exceeds a predetermined level.
52. (new) The system of claim 45, wherein the antenna/charging coil has a plurality of turns
of wire wrapped around a coil spool.

53. (new) The system of claim 45, further comprising a chair pad that is comprised of:
a compliant housing made of foam; and
a coil assembly housing which contains the antenna/charging coil and a chair pad PCB,
wherein the foam housing encapsulates the coil assembly housing.
54. (new) The system of claim 53, wherein the chair pad is further comprised of:
an exterior slipcover that surrounds the housing.
55. (new) The system of claim 53, further comprising:
a chair pad cable that connects the chair pad to the base station; and
detection circuitry for automatically detecting disconnection of the chair pad cable from the chair pad.
56. (new) The system of claim 45, further comprising:
a booster coil that is placed in a coil assembly with the antenna/charger coil, wherein
the booster coil and antenna coil are wound over a spool coil in a configuration to
present at least one substantially flat side;
wherein the coil assembly is fully encapsulated in an external housing.
57. (new) The system of claim 56, wherein the housing is foam.
58. (new) The system of claim 45, wherein the base station includes:
a speaker for generating an audible sound to signal a system event.

59. (new) The system of claim 45,
wherein the first circuitry is impedance matched to the antenna/charging coil with a
first impedance matching network.
60. (new) The system of claim 59, wherein the first impedance matching network is a 50
Ohm matching network.
61. (new) The system of claim 45, wherein the system includes the implantable stimulator,
and wherein the implantable stimulator is a microstimulator having a maximum length-wise
dimension of about 3.5 centimeters and a maximum width of about 5 millimeters.